

TUBE PLUG INSTALLATION INSTRUCTIONS

The following steps are required to assure the best seal possible for the **Elliott** two piece “**Ring and Pin**” tube plugs when plugging shell and tube heat exchanger vessels. These instructions are for brass, carbon steel, and stainless steel tube plugs. For titanium tube plugs, see **Elliott** instruction sheet **SD349**. For other materials not listed, contact the factory at **800-332-0447**, fax **937-253-9189** or email **sales@elliott-tool.com** for additional information.

Step 1

If the tube OD and gage is not known the tube ID must be measured. To measure the ID of the tube to be plugged use an **Elliott 876200 series** tube gage or equal, measure the tube in the rolled area of the tube sheet. If the measurement is taken behind this rolled area, the false reading may result in the improper size plug being selected. In the event that the tube has been removed and the tube sheet is being plugged, measure the sheet hole ID making certain that the measurement is not taken in the grooved area of the tube sheet.

Step 2

Select the proper size ring and pin required using the chart in your Elliott Catalog or Product Selection CD, or consult the factory for sizing assistance. The proper sized ring will be as close to the ID as possible, but not so close as to require force to insert the ring into the tube end or tube sheet hole.

Step 3

Select the proper material required for the tube plug. It is typical for HVAC vessels to either match the plug material to the tube material or to the tube sheet material. In the petrochemical industry, these general guidelines may or may not apply. Always consult the heat exchanger manufacturer or the plant engineer where the vessel is used if in doubt.

Step 4

Before installing the plug, the tube end or tube sheet hole must be as clean as possible. Remove any oil, grease, or other lubricants that could affect the sealing surface of the plugs. Check for scratches that run from the inside of the tube sheet to the outside of the tube sheet. These scratches can result in a leak path after plugging. Brushing the plugging area with an **Elliott 5510 series turbo brush** will provide an ideal surface for tube plug installation.

Step 5

Determine if the tubes require puncturing before the plugs are installed. Many applications require the tubes be punctured to allow flammable liquids to drain out or to eliminate the possibility of pressure building up inside the plugged tube. Use the **Elliott 9060 series tube cutter** for this job. Manually rotate the cutter clockwise until the blade pierces the tube wall. Reverse rotation and the cutter blade retracts so the tool can be removed. Continual clockwise rotation will result in the tube being severed.

Step 6

Make sure the ring and pin are clean and free from any lubricants or debris. Insert the ring into the tube end or tube sheet hole to be plugged. Position the ring so that the flange shoulder rests against the tube end or the tube sheet face. This flange positions the ring in the rolled area of the tube and prohibits the ring from moving while the pin is driven in. The ring should be free to rotate at this time. Insert the mating pin into the ring. Lightly tap the pin into the ring until the ring can no longer be rotated by hand. This is called “metal to metal” contact. To complete the plugging process, drive the pin deeper into the ring. This should be done with one or two heavier blows to the pin. The pin should not be driven in more than 1/16” deeper after the “metal to metal” contact has been made. Doing so may actually damage the tube sheet hole ligaments, causing the adjacent tubes to start leaking. If the rings are not sealing at this setting, contact the factory for additional information.

TUBE PLUG REMOVAL INSTRUCTIONS

Below are a few methods that have proven to be effective for removing tube plugs after they are installed. As always, care should be taken to avoid damaging the tube sheet hole.

Splitting

Remove the pin from the ring by twisting the pin to break the mechanical bond. Vice grips or a pipe wrench should be used. If the pins do not have enough length sticking out to secure a grip, the pin must be drilled out. A chisel can then be used to split the ring into two halves for easy removal. Another option would be to chisel a section of flange away and use an **Elliott 8637 series collapsing tool** to split the ring. When splitting the ring, always work at the thickest part of the ligament possible to avoid tube sheet damage.

Drilling

Remove the pin from the ring by twisting the pin to break the mechanical bond. As mentioned above, the pin may require drilling to remove. By using a drill that is the same size as the tube plug ring body, the entire ring may be drilled out. A chisel can then be used to split the flange, and the ring can be removed.

Heating

By heating the pin to approximately 1000 degrees Fahrenheit, and then quickly chilling it with cold water, the ring and pin will loosen up enough to be removed. Care should be taken so that the tube sheet is not directly subjected to this heat.

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